

Serial No.: 10/759,496

IN THE DRAWINGS:

Please amend the drawings as follows:

Replacement sheets of drawings are submitted herewith to replace the original sheets of drawings.

REMARKS

I. Status Summary

Claims 1-36 and 38-46 are pending in the present application. Claims 1-36 and 38-46 currently stand rejected by the U.S. Patent and Trademark Office (hereinafter "the Patent Office"). The drawings have been made the subject of an objection.

Claims 1, 44, and 45 have been amended. Replacement drawings have been submitted. Support for the amendments, replacement drawings and new claims can be found in the application as filed. No new matter has been added. Therefore, upon entry of Amendment D, claims 1-36 and 38-46 will be pending in the subject application.

Reconsideration of the application as amended and further in view of the remarks set forth hereinbelow is respectfully requested.

II. Drawing Objections

The Patent Office has required new corrected drawings. More particularly, the Patent Office alleges that the lettering is not of proper size, uniform density and/or is cut off in Figures 1 and 4. The Patent Office further alleges that in Figures 3, 12A and 17, the shading does not allow for visualization of the features. Finally, the Patent Office contends that the images of Figures 11, 12C and 15 are not clean and well defined.

Figure 1 has been replaced and the cut off lettering therein has been corrected. The text has been enlarged in Replacement Figure 4. The shading has been removed from Figure 3. The thermographs of Replacement Figure 11 show greater contrast. Solid shading has been removed from Figure 12A. Figure 12C has been replaced to show the density of attached nanoparticles with greater contrast. Figure 15 has been reprinted to show greater contrast in the thermogram shown therein. Solid shading has been removed from Figure 17.

Replacement drawings are being submitted herewith. Applicants submit that the replacement drawings comply with 37 CFR 1.121(d). No new matter has been added.

III. Response to the Rejections under 35 U.S.C. § 112, First Paragraph

Claims 1-36 and 38-46 have been rejected under 35 U.S.C. § 112, first paragraph for allegedly failing to meet the enablement requirement. In particular, the Patent Office contends that, while the specification is enabling for the method of claims 45 and 46 with the added limitation that the solid support and nanoparticles are not the same, that the thermal properties of the support and nanoparticles are not the same, that the unbound nanoparticles are removed prior to detection, and that the probe binds only to the target, the specification does not provide an enabling disclosure for the detection of any target nucleic acid when the solid support and nanoparticles are one and the same. Further, the Patent Office contends that the specification does not enable the use of any probe that is "in part" complementary to a target nucleic acid.

After careful consideration of the rejections and the Patent Office's comments, applicants respectfully traverse the rejections and offer the following remarks.

Initially, without acquiescing to the contentions of the Patent Office, applicants respectfully submit that claims 1 and 44 have each been amended herein to recite the step of "removing unattached nanoparticle and unhybridized nucleic acid from the solid surface." Support for the amendment can be found in the instant specification at page 36, lines 10-11 and page 37, lines 8-9.

Claim 45 has been amended herein to recite removing unattached nanoparticle. Support for the amendment can be found in the instant specification at page 37, lines 8-9.

Claims 1 and 44 have each been amended herein to recite that providing a hybridization complex is performed under conditions wherein the capture probe selectively hybridizes to the target nucleic acid. Support for the amendments can be found in the instant specification at page 37, lines 17-20.

Applicants respectfully submit that the scope of enablement must only bear a reasonable correlation to the scope of the claims. See Manual of Patent Examining Procedure (hereinafter "MPEP") § 2164.08, citing *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). Further, claims are not to be rejected as broader than the enabling disclosure under 35 U.S.C. § 112, for noninclusion of limitations dealing with factors which must be presumed to be within the level of ordinary skill in the art; the claims need not recite factors where one of ordinary skill in the art would consider obvious. See MPEP § 2164.08 citing *In re Skrivan*, 427 F.2d 801, 806, 166 USPQ 85, 88 (CCPA 1970).

Applicants respectfully submit that claim 1 as previously presented recites "exposing the solid surface to light at a wavelength absorbed by the nanoparticle and not by the solid surface." Similarly, claim 44 as previously presented recites "exposing the solid surface to light at a wavelength that matches the surface plasmon resonance of the nanoparticle and is not absorbed by the solid surface." Claim 44 also recites, "the solid surface is a material different than the nanoparticle." Claim 45 as previously presented recites "at least one spherical gold nanoparticle" and "a solid surface selected from glass and indium tin oxide." Finally, the specification states, "... the solid substrate can be any material that does not absorb significantly at the light excitation wavelength used for nanoparticle irradiation." Instant Specification, page 22, lines 13-15. Accordingly, applicants respectfully further submit that one of ordinary skill in the art would understand that the methods of claims 1, 44, and 45 and their dependent claims relate to solid surfaces and nanoparticles of different thermal properties.

With regard to the Patent Office's remarks regarding the detection of both target and non-target nucleic acids, applicants respectfully submit that claims 1, 44, and 45 as previously presented each recite providing a hybridization complex comprising the target nucleic acid hybridized to the capture probe. Thus, applicants respectfully submit that one of ordinary skill in the art would understand that the method is directed to providing a complex comprising the capture probe hybridized to the target nucleic acid.

In addition, as described hereinabove, claims 1 and 44 have been amended herein to recite that the hybridization complex is provided by using conditions wherein the capture probe selectively hybridizes to the target nucleic acid. As noted in the instant specification, selective hybridization refers to the hybridization of a molecule (e.g., a capture probe) to a particular nucleotide sequence (e.g., a target nucleic acid). See Instant Specification, page 37, lines 17-20 and page 39, lines 5-11. For example, selective hybridization can involve the use of stringent conditions when the target is present in a complex or heterogeneous mixture. See Instant Specification, page 21, lines 15-18 and page 37, line 29 to page 39, line 16. The instant specification therein further describes that stringent hybridization conditions are those that can preclude hybridization of random, non-complementary sequences (e.g., non-target sequences). Applicants further respectfully submit that no undue experimentation would be required by one of ordinary skill in the art to vary the hybridization conditions to provide selective hybridization in view of the level of ordinary skill in the art as well as guidance in the instant specification that the hybridization conditions can be varied, particularly based on the lengths of the nucleic acid sequences involved (i.e., the lengths of probe and target), the base content of the sequences, and the presence of other compounds. See *Id.*

Applicants respectfully disagree with the Patent Office's contention that the specification does not enable the use of any probe that is "in part" complementary to the target nucleic acid. Generally, the instant specification describes that probes have a capacity to selectively hybridize to a complementary target sequence in a heterogeneous mixture of nucleic acid molecules. See Instant Specification, page 37, lines 17-20 and page 39, lines 5-11. The instant specification also describes that, in some embodiments, the probe comprises at least one oligonucleotide that is complementary to a contiguous nucleic acid sequence of a target such that the oligonucleotide (i.e., the probe) specifically hybridizes to the target. See Instant Specification, page 21, lines 15-19 and page 36, lines 6-9. Further, the instant specification provides guidance with regard to the use of sandwich format hybridization assays wherein the capture probe comprises an oligonucleotide

complementary to a first domain of the target nucleic acid and a nucleotide-containing detection probe is complementary to a second, non-overlapping domain of the target. See Instant Specification, page 15, line 24 to page 16, line 2; and page 36, lines 19-33. Accordingly, applicants respectfully submit that the instant specification as filed provides enablement with regard to embodiments wherein the capture probe is not necessarily complementary in whole to the target.

Finally, applicants respectfully submit that one of ordinary skill in the art would have understood that to detect target nucleic acid, as recited by the presently pending claims, any nanoparticle and or nanoparticle/nucleic acid not part of the hybridization complex comprising the target nucleic acid can be removed to decrease the chances of detecting false positive signal. In an effort to expedite the allowance of the instant application and without acquiescing to the contentions of the Patent Office, the claims have been amended herein to recite a step of removing unattached nanoparticle or unattached nanoparticle and unhybridized nucleic acid from the solid surface. Thus, applicants respectfully submit that the Patent Office's remarks regarding the possible presence of non-immobilized nanoparticle and/or unhybridized nucleic acid and their ability to potentially result in a meaningful signal have been addressed.

Accordingly, applicants respectfully request that the rejections of claims 1-36 and 38-46 under 35 U.S.C. § 112, first paragraph, be withdrawn. Applicants respectfully ask that claims 1-36 and 38-46 be allowed at this time.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any additional fees associated with the filing of this correspondence to Deposit Account No. 50-0426.

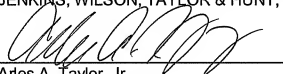
Respectfully submitted,

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Date:

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Enclosures